



COMMITTEE ON
SCIENCE, SPACE, & TECHNOLOGY
Lamar Smith, Chairman

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Media Contacts: Alicia Criscuolo, Thea McDonald
(202) 225-6371

Statement of Chairman Brian Babin (R-Texas)
Next Steps to Mars: Deep Space Habitats

Chairman Babin: The exploration of space, particularly human exploration of Mars, has intrigued generations around the world. Our sister planet holds many mysteries, and quite possibly, the keys to our past and our future. The profound goal of putting humans on Mars and perhaps establishing a settlement there, fuels our desire to push the boundaries of what is possible and to reach far beyond our own planet.

Space exploration is in our DNA. Americans of all ages watched on their black and white TVs as Neil Armstrong stepped onto the surface of the Moon. Our collective interests have not waned since that time. However, we now watch in full color and high definition as we launch off our planet, land a rover on Mars, and see our astronauts on the International Space Station do an EVA to assemble an orbital space laboratory.

Enabled by the unwavering dedication and hard work of countless thousands who have contributed to the historical successes and immeasurable benefits spaceflight and exploration have brought humanity.

Last year's cinematic blockbuster, *The Martian*, based on the book written by Andy Weir, one of our witnesses today, wrote about the challenges an astronaut faced in order to survive the hostile environment of Mars. This concept is directly related to the topic of our hearing – examining the challenges and discussing what it is going to take to turn this science fiction into reality...as we hope to do in the years ahead.

One of the foremost requirements for success in such a profound endeavor is the support of Congress...and undoubtedly, bipartisan, bicameral support is strongly behind this goal.

In fact, bipartisan support for our spaceflight and exploration programs is so strong, that the 2016 NASA Authorization Act passed the House by a unanimous voice vote. In this turbulent political climate, a vote like that is exceptional for any Agency. The House's intent is clear and I strongly urge our colleagues in the Senate to join us by taking up and passing a NASA Authorization bill this year. Doing so, in this election year, is particularly important as it will provide NASA programs the stability needed through the uncertainty that results during the transition of Administrations.

One of the most critical capabilities needed to sustain humans for a journey to Mars is a habitat. Without a viable habitat to protect our astronauts from the inhospitable environment of space, we cannot achieve our goals for human deep space exploration.

Congress demonstrated its strong support of space exploration last year in passing the most significant update to commercial space law in decades and by appropriating robust and increased funding levels for NASA exploration programs.

In the 2016 appropriations, Congress directed NASA to invest no less than \$55 million for the development of a “habitation augmentation module to maximize the potential of the SLS/Orion architecture in deep space” and to develop a prototype module no later than 2018.

Astronaut Scott Kelly's nearly year-long mission aboard the International Space Station has provided substantial scientific data which we continue to assess, related to the physiological and psychological impacts humans face during long-duration space missions. However, much research still needs to be done to develop systems and operations to mitigate these impacts for sustaining crew health; for this reason, it is critical that the ISS be fully utilized through 2024.

We know what goal we want to achieve – *putting humans on Mars*. What continues to be unclear...is the detailed plan? How are we going to accomplish this bold and challenging goal? What are the requisite precursor missions, the technologies, sustaining systems, and habitation requirements and current capabilities?

While the ISS continues to provide us with a critical test-bed for technology development, we need to be careful not to use it as a “crutch” – a convenient low-Earth orbit safe haven, should it be needed during a deep space mission or flight test through 2024. What if we didn't have this back-up capability, as was the case during the Apollo missions to the Moon. What's our back-up plan...do we have one?

Until the detailed plan is outlined, there are many “unknowns” but what we do know is that NASA WILL need habitation and there are many questions that surround this requirement.

How will NASA acquire habitation? How will development be funded? Will NASA develop the capability by contracting with a company on a cost-plus basis as it did for programs in past? Or will they seek to procure habitation as a service by leveraging previous development work? Will NASA use public-private partnerships? And if so, how will NASA divide the investment? How will it treat the intellectual property? And will the taxpayer get a deal on the price if it contributes to the development?

We have tremendous “lessons learned” related to systems development along with the pros and cons of various acquisition approaches. Regardless of the ultimate decision, the acquisition parameters and requirements must be clear before ANY action is taken...NASA simply doesn't have the time or the budget to “experiment” on unproven acquisition models. It's long past time to apply the “lessons learned” and make the decision based on what is the most assured and efficient way for NASA to acquire this capability.

Whatever NASA proposes, I sincerely hope it will be in the best interests of the taxpayer. It would be a shame if we repeat the mistakes of the past...government paying for the development of habitation capabilities, then turns around and pays again to procure the service from the same provider. NASA's decisions on “make” or “buy” will be critical.

Is it possible that industry may be able to provide turn-key cost-effective services that are developed with minimal taxpayer support? Is there a market for low-Earth orbit habitats, sufficient to support a post-ISS paradigm, which can be leveraged for deep-space habit requirements?

We are an exceptional nation of “doers” and as we forge a path through the high-ground of space on our journey to Mars, I have strong faith in the ingenuity of American scientists, engineers and the entire industry to address the challenges posed by deep space exploration and to develop the spaceflight systems needed to reach our goals in a safe, sustainable and affordable way.

I'm pleased to welcome our witnesses and I look forward to hearing their perspectives as to how NASA should consider acquiring habitation goods and services to meet future mission requirements.

Thank you all for participating. And Mr. Weir, I would like to personally thank you for your captivating work, *The Martian*...it has everybody talking about Mars...which I believe brings us one step closer to making science fiction, science fact.

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